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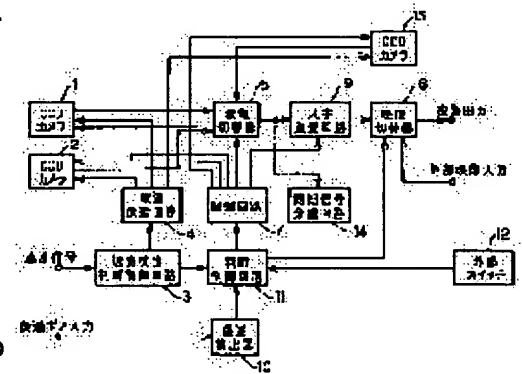
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(54) DEVICE FOR MONITORING SIDE OF VEHICLE

(57)Abstract:

PROBLEM TO BE SOLVED: To stop display of videos from cameras during driving and to select any of videos for both sides in front of a vehicle or for a rear side simply in interlocking with the drive operation.

SOLUTION: An external switch 12 is used to select the case that videos from video cameras 1, 2 installed to both sides in front of a vehicle are singly displayed or displayed while being switched alternately. Furthermore, in the case a backward detector 10 detects the backed vehicle, a rear video image photographed by a rear supervisory camera 13 is displayed. A control circuit 7 controls a video changeover device 5 to select any of camera images and a discrimination control circuit 11 controls a video changeover device 6 based on speed information detected by a speed detection discrimination circuit control circuit 3 to display the camera image on a display device only at stop or at a low speed. Furthermore, a synchronizing separator circuit 14 separates a vertical synchronizing signal to locate a faulty camera and a character superimposing circuit 9 displays it in characters or a symbol.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to car side supervisory equipment for the image by two sets of the video cameras arranged in the both-sides section for example, ahead of a car to protect the dead angle of the crossing by the wall, a place behind something, etc.

[0002]

[Description of the Prior Art] Conventionally, as this kind of car supervisory equipment, what was indicated in JP, 7-215130, A back is known, and that configuration is shown in drawing 14. In drawing 14, the picture signal outputted from the cameras 101, 102, 103, and 104 installed in each part of an automobile is chosen by the change control means 108 which makes a control signal information from operational status detection means, such as the direction detection means 105 of a blinker, the direction detection means 106 of a handle, and the directions input means 107, and is displayed on the image display means 109. The operator of an automobile can check a required image easily with the image display means 109 among the images of the perimeter obtained with cameras 101-104, and can get the assistance for plying an automobile safely. The video camera other than the supervisory equipment interlocked with such a blinker is installed in the car back, the signal of a go-astern gear or a back-up lamp is detected, a camera input image and other external video signals are changed, and there is also equipment which secures the insurance at the time of retreat by displaying the output on a display. Moreover, as supervisory equipment to the time of crossing penetration, image formation of the image on either side is carried out to one set of a video camera with an optical means, and the equipment which supervises the situation of right and left of the car front is also known.

[0003]

[Problem(s) to be Solved by the Invention] However, in the supervisory equipment interlocked with the above-mentioned conventional blinker, it could not be used during rectilinear-propagation transit, and at the crossing etc., with the directions direction of a blinker, when the image of an opposite hand was important because of a safety check, a blinker could not be turned to the opposite hand, but there was a problem of not being user-friendly. Moreover, in order to connect two or more sets of video cameras, it became individual control, without mutual display relation interlocking only by extending a transfer device, and there was a problem that operability was not good. Furthermore, carrying out image formation of the image on either side to one camera with an optical means could picturize only the image of the include angle before the front face of a car, but it had problems, such as reduction of reduction of the screen product per single-sided 1 image, reduction of the resolution of an image pick-up, depth, and a sense of distance

[0004] This invention solves such a conventional problem and aims at offering the car side supervisory equipment which could presuppose at arbitration that it is non-display, was simply changed in the image of the method of both sides ahead of a car, or back, is interlocked with operation and enabled it to perform the change display also in transit.

[0005]

[Means for Solving the Problem] In order to attain the above-mentioned object, this invention the image from the video camera installed in the both sides ahead of a car An operator enables it to choose as arbitration the case where change to the case where it displays independently, respectively, by turns, and it displays. Furthermore can display the image of car back, or it enables it to display the image which compounded the image which two or more image pick-up mean: picturized, two or more images of a direction which is different in one display can be displayed, and a safety check can

be performed easily and certainly.

[0006]

[Embodiment of the Invention] 1st image pick-up means by which invention of this invention according to claim 1 picturizes one side ahead of a car, The 2nd image pick-up means which picturizes the side of another side ahead of a car, and the speed detection decision control means which detects independently the low speed of the plurality of a car set up beforehand, and outputs it, A current supply means to turn on the power source of said 1st and 2nd image pick-up means, and to turn off, The 1st image change means which changes the image picturized with said 1st and 2nd image pick-up means, The 2nd image change means which has an external image input terminal and changes said the 1st output and external image input of an image change means, It is based on the conditions beforehand defined according to the detection value of said speed detection decision control means, and the conditions set up by the Out switch. It has the control means changed alternately with right immobilization, left immobilization, or right and left according to the passage-of-time conditions by which said 1st image change means was provided beforehand. It is car side supervisory equipment characterized by starting a display automatically whenever a car is in a halt or a going-slowly condition, and changing and displaying the image of the method of both sides ahead of a car. Since it supposes that it is non-display at the time of high-speed transit of a car, and a display is automatically started whenever a car is in a halt or a going-slowly condition, are safe. Moreover, an operator can choose displaying independently, or changing the image of right and left of the car front by turns, and displaying it as arbitration, two or more images of a direction which is different in one display can be displayed, and it has an operation that a safety check can be performed easily and certainly.

[0007] Invention of this invention according to claim 2 supervises the output of said 1st image change means, and detects the existence of a video signal. Since it can judge whether it is car side supervisory equipment according to claim 1 characterized by having an image detection means to input the result into said control means, and which image pick-up means broke down between two image pick-up means It has an operation that it can continue with the image pick-up means of the direction which is not out of order, and a side monitor can be performed.

[0008] It is car side supervisory equipment according to claim 1 characterized by equipping invention of this invention according to claim 3 with an alphabetic character superposition means to superimpose the alphabetic character or notation signal corresponding to control lead of said control means on the output of said 1st image change means, and to input it into said 2nd image change means. Since it can indicate whether the image by which it is indicated by current is a thing from which image pick-up means, it has an operation of being easy to understand a screen display.

[0009] An image detection means for invention of this invention according to claim 4 to supervise the output of said 1st image change means, to detect the existence of a video signal, and to input the result into said control means, It is car side supervisory equipment according to claim 1 characterized by having an alphabetic character superposition means to superimpose the alphabetic character or notation signal corresponding to control lead of said control means on the output of said 1st image change means, and to input it into said 2nd image change means. Since it can indicate whether the image by which it is indicated by current is a thing from which image pick-up means even when one of image pick-up means breaks down, it has an operation of being easy to understand a screen display.

[0010] By having a go-astern detection means to detect that invention of this invention according to claim 5 went into the go-astern gear, and applying the output to said speed detection decision control means Since it is car side supervisory equipment given in either of claims 1-4 characterized by making non-display the image from said image pick-up means, go-astern actuation is interlocked with and the image of the front side is made non-display when a go-astern gear enters, it has an operation of being easy to understand a screen display.

[0011] 1st image pick-up means by which invention of this invention according to claim 6 picturizes one side ahead of a car, The 2nd image pick-up means which picturizes the back of a car, and the speed detection decision control means which detects independently the low speed of the plurality of a car set up beforehand, and outputs it, A current supply means to turn on the power source of said 1st and 2nd image pick-up means, and to turn off, The 1st image change means which changes the image picturized with said 1st and 2nd image pick-up means, The 2nd image change means which has an external image input terminal and changes said the 1st output and external image input of an image change means, The decision control means which performs change control to said 2nd image change means based on the signal from a go-astern detection means to detect having gone into the go-astern gear, and the conditions beforehand defined according to the detection value of said speed detection decision control means, the conditions set up by the Out switch and said go-astern detection means, It has the control means changed alternately with right

immobilization, left immobilization, or right and left according to the passage-of-time conditions by which said 1st image change means was beforehand provided based on the output of said decision control means. While a display is automatically started whenever a car is in a halt or a going-slowly condition, and usually displaying the car front 1 side. When a go-astern gear enters, it is car side supervisory equipment characterized by displaying the back of a car, and has an operation that operation is interlocked with and the image of the car front 1 side and car back can be displayed.

[0012] 1st image pick-up means by which invention of this invention according to claim 7 picturizes one side ahead of a car, The 2nd image pick-up means which picturizes the side of another side ahead of a car, and the 3rd image pick-up means which picturizes the back of a car, The speed detection decision control means which detects independently the low speed of the plurality of a car set up beforehand, and outputs it, A current supply means to turn on the power source of the said 1st, 2nd, and 3rd image pick-up means, and to turn off, The 1st image change means which changes the image picturized with the said 1st, 2nd, and 3rd image pick-up means, The 2nd image change means which has an external image input terminal and changes said the 1st output and external image input of an image change means, The decision control means which performs change control to said 2nd image change means based on the signal from a go-astern detection means to detect having gone into the go-astern gear, and the conditions beforehand defined according to the detection value of said speed detection decision control means, the conditions set up by the Out switch and said go-astern detection means, It has the control means changed alternately with right immobilization, left immobilization, or right and left according to the passage-of-time conditions by which said 1st image change means was beforehand provided based on the output of said decision control means. While a display is automatically started whenever a car is in a halt or a going-slowly condition, and usually displaying the right side ahead of a car, the left side, or by turns. When a go-astern gear enters, it is car side supervisory equipment characterized by displaying the back of a car, and has an operation that operation is interlocked with and the both sides of the front side of a car and a back image can be displayed.

[0013] Invention of this invention according to claim 8 prepares a frame reset pulse input in the circuit of the said 1st, 2nd, and 3rd image pick-up means. It is car side supervisory equipment according to claim 7 characterized by having a synchronizing signal separation means to dissociate from a video signal and to input into said control means the Vertical Synchronizing signal by the side of the image pick-up means which is indicating by current. Since it can judge whether which image pick-up means broke down among three image pick-up means, it has an operation that it can continue with the image pick-up means of the direction which is not out of order, and a side monitor can be performed.

[0014] Invention of this invention according to claim 9 It is car side supervisory equipment given in either of claims 5-8 characterized by having an alphabetic character superposition means to superimpose the alphabetic signal or notation signal corresponding to control lead of said control means on the output of said 1st image change means, and to input it into said 2nd image change means at least. Since it can indicate any the image pick-up means which can be supervised are, and whether an image on display is the thing of which image pick-up means, it has an operation of being easy to understand image display.

[0015] 1st image pick-up means by which invention of this invention according to claim 10 picturizes one side ahead of a car, The 2nd image pick-up means which picturizes the side of another side ahead of a car, and the 3rd image pick-up means which picturizes the back of a car, The speed detection decision control means which detects independently the low speed of the plurality of a car set up beforehand, and outputs it, A current supply means to turn on the power source of the said 1st, 2nd, and 3rd image pick-up means, and to turn off, An image composition means to compound the image picturized with the said 1st, 2nd, and 3rd image pick-up means on one image, The image change means which has an external image input terminal and changes the output and external image input of said image composition means, The decision control means which performs change control to said image change means based on the signal from a go-astern detection means to detect having gone into the go-astern gear, and the conditions beforehand defined according to the detection value of said speed detection decision control means, the conditions set up by the Out switch and said go-astern detection means, It has the control means which performs synthetic control of said image composition means based on the output of said decision control means. It is car side supervisory equipment characterized by starting a display automatically whenever a car is in a halt or a going-slowly condition, compounding the image of the car front side and back suitably, and indicating by change. It has an operation that the image picturized with two or more image pick-up means is compounded on a small screen by image composition, and can be displayed.

[0016] (Gestalt 1 of operation) Drawing 1 shows the configuration of the car side supervisory equipment in the gestalt 1 of the operation corresponding to claim 1 of this invention. In drawing 1 , 1 is the CCD camera which used the solid

state image pickup device, and picturizes the car front right side. Similarly 2 is a CCD camera using a solid state image pickup device, and picturizes the car front left side. It is a speed detection decision control circuit, 3 inputs the signal from the signal generator for rate meter (not shown) attached in the output shaft which can measure the rate of a car, as shown in drawing 3, detects independently two or more low speeds to which the car was set beforehand, and outputs them. This speed detection decision control circuit 3 measures a time interval based on the changing point of a signal, and in a low speed, since it is sufficiently large, measurement of a time interval is desirable [the control circuit] also from the point of the reaction time in the case of detection. 4 is a current supply circuit, receives the indication signal from the speed detection decision control circuit 3, and turns on and turns off the power source of CCD cameras 1 and 2. 5 is the 1st video switching unit and changes the image which CCD cameras 1 and 2 picturized. 6 is the 2nd video switching unit, it changes the 1st output and external image input of a video switching unit 5, sends the video output to a display (not shown), and displays an image. 7 is a control circuit and performs control changed for every progress for 1 second alternately with right immobilization, left immobilization, or right and left according to the time amount conditions by which the 1st image change means 5 was able to be beforehand provided according to the conditions defined according to the detection value of the speed detection decision control circuit 3, and the conditions defined based on the input of Out switch 12 as shown in drawing 2. 12 is an Out switch and can set up four conditions, the conditions which choose a left camera, the conditions which choose a right camera, the conditions which choose a camera on either side by turns, and the conditions which turn off the display with a camera compulsorily, like drawing 2 (b) by having a left camera, right-and-left alternation, a right camera, and four switches of all functions, and pushing like drawing 2 (a), combining each switch.

[0017] Next, actuation of the gestalt 1 of the above-mentioned implementation is explained. The speed detection decision control circuit 3 performs directions of the current supply to CCD cameras 1 and 2 to the current supply circuit 4, change control corresponding to the conditions of drawing 2 to a control circuit 7, and change control corresponding to the conditions of drawing 3 to the 2nd video switching unit 6 based on the conditions set up by the car rate and Out switch 12 which self detected. As shown in drawing 3, while a car rate accelerates from zero, i.e., a idle state, sends directions of power-source ON in the current supply circuit 4 to a fixed rate and operates CCD cameras 1 and 2, directions are sent so that the image of CCD cameras 1 and 2 may be displayed to the 2nd video switching unit 6. If a car rate reaches a display off rate, directions will be sent so that not a camera display but an external image may be displayed on the 2nd video switching unit 6. External images are information, such as information from a television signal or navigation equipment, and VICS, ATIS, and the information on other. If a car rate rises further and exceeds a power-source turning-on-and-off rate, delivery and the current supply circuit 4 will suspend directions of power-source OFF for the power source of CCD cameras 1 and 2 to the current supply circuit 4. You may make it delay the direction which turn off a power source during a fixed period at this time, so that ON and OFF may not be frequently repeated in short time amount. Then, when a car rate slows down and it becomes below a power-source turning-on-and-off rate again, a power source is supplied to CCD cameras 1 and 2 through the current supply circuit 4, and an image is made to output. If a car rate furthermore falls and a ~~display-ON rate is reached, while directing to choose a camera display as the~~ 2nd video switching unit 6, ~~it directs to start control~~ of the 1st video switching unit 5 to a control circuit 7. A control circuit 7 controls the 1st video switching unit 5, chooses either right immobilization, left immobilization or the display of right-and-left alternation about the image of two cameras 1 and 2, and makes it display it on a display as setups, such as Out switch 12, with the time interval beforehand set up from the time amount which started control.

[0018] Thus, since according to the gestalt 1 of the above-mentioned implementation a display is automatically started whenever a car is in a halt or a going-slowly condition, and the image from two cameras 1 and 2 is changed alternately with right immobilization, left immobilization, and ~~right-and-left~~ and is displayed according to the input condition of Out switch 12, ~~two or more images can be displayed on the one display screen.~~ Moreover, an image can be displayed on a display, without reducing a screen size, and without lifting a hand from the handle of a car, a car rate can be interlocked with during car transit, and the change of a display of an image can be changed easily. Moreover, since it was made to perform the image check with cameras 1 and 2 only at the time of a halt or a low speed, power consumption, such as a battery of a car, can be held down to necessary minimum.

[0019] (Gestalt 2 of operation) Drawing 4 shows the configuration of the car side supervisory equipment in the gestalt 2 of the operation corresponding to claim 2 of this invention. The gestalt 2 of this operation adds the image detector 8 to the configuration of the gestalt 1 of the above-mentioned implementation, and since other configurations are the same as the gestalt 1 of operation, it omits the explanation which gave the same sign to the same component and

overlapped. The image detector 8 supervises the signal from [from the output of the 1st video switching unit 5] CCD cameras 1 and 2, detects the existence of an image, and outputs it to a control circuit 7. In addition, when an image is a composite synchronizing signal, the image detector 8 may be constituted from a synchronizing separator circuit which separates and outputs a synchronizing signal from an image, and may be transposed to detection of the existence of a synchronizing signal.

[0020] The actuation in the gestalt 2 of this operation is fundamentally the same as the gestalt 1 of operation, and inputting the output of the image detector 8 into a control circuit 7, and controlling change actuation of the 1st video switching unit 5 differ. thereby -- right and left -- when one of CCD cameras broke down, or when the image of one of the two's CCD camera cannot be outputted by a collision etc., a side monitor can be chosen the CCD camera of the direction which can output an image and performed continuously.

[0021] (Gestalt 3 of operation) Drawing 5 shows the configuration of the car side supervisory equipment in the gestalt 3 of the operation corresponding to claim 3 of this invention. The gestalt 3 of this operation adds the alphabetic character superposition circuit 9 to the configuration of the gestalt 1 of the above-mentioned implementation, and since other configurations are the same as the gestalt 1 of operation, it omits the explanation which gave the same sign to the same component and overlapped. The alphabetic character superposition circuit 9 outputs the alphabetic signal according to directions of operation or notation signal of a control circuit 7 to a signal in piles from CCD cameras 1 and 2 at a video signal. The purport which is a right-hand side camera when a control circuit 7 controls the 1st video switching unit 5 and chooses right-hand side CCD camera 1 by this is displayed. When the conditions which display the purport which is a left-hand side camera when left-hand side CCD camera 2 is chosen, and display a camera on either side by turns are chosen, a display to that effect can be performed, and it can know easily what kind of image is displayed now.

[0022] (Gestalt 4 of operation) Drawing 6 shows the configuration of the car side supervisory equipment in the gestalt 4 of the operation corresponding to claim 4 of this invention. The gestalt 4 of this operation adds the image detector 8 and the alphabetic character superposition circuit 9 to the configuration of the gestalt 1 of the above-mentioned implementation, and since other configurations are the same as the gestalt 1 of operation, it omits the explanation which gave the same sign to the same component and overlapped. The image detector 8 supervises the signal from [from the output of the 1st video switching unit 5] CCD cameras 1 and 2, detects the existence of an image, and outputs it to a control circuit 7, and the alphabetic character superposition circuit 9 outputs the alphabetic signal according to directions of operation or notation signal of a control circuit 7 to a signal in piles from CCD cameras 1 and 2 at a video signal. thereby -- right and left -- when one of CCD cameras break down, a side monitor can be chosen the CCD camera of the direction which can output an image and performed continuously. Moreover, it can know easily the image from which CCD camera is displayed now with an alphabetic character, a notation, etc. That can be displayed when a failure furthermore occurs. When a failure occurs, you may enable it to set up whether that is displayed or not with Out switch 12.

[0023] (Gestalt 5 of operation) Drawing 7 shows the configuration of the car side supervisory equipment in the gestalt 5 of the operation corresponding to claim 5 of this invention. The gestalt 5 of this operation adds the go-astern detector 10 to the configuration of the gestalt 1 of the above-mentioned implementation, and since other configurations are the same as the gestalt 1 of operation, it omits the explanation which gave the same sign to the same component and overlapped. The go-astern detector 10 detects a go-astern gear input, and inputs it into the speed detection decision control circuit 3. The speed detection decision control circuit 3 will change and display the 2nd video switching unit 6 on an external image input, if a go-astern detecting signal is received from the go-astern detector 10, and if the input of a go-astern detecting signal is lost, it will return to the supervision mode of the front side of a basis. Thus, since according to the gestalt 5 of this operation an image is changed to an external image when a car goes astern, a display image can be made legible and misunderstanding and confusion can be prevented.

[0024] (Gestalt 6 of operation) Drawing 8 shows the configuration of the car side supervisory equipment in the gestalt 6 of the operation corresponding to claim 6 of this invention. While the gestalt 6 of this operation forms CCD camera 13 for a back monitor in the car back instead of CCD camera 2 in the gestalt 1 of the above-mentioned implementation (to or substitute of CCD camera 1) The go-astern detector 10 which detects a go-astern gear input and is inputted into the speed detection decision control circuit 3, The decision control circuit 11 which performs change control to the 2nd video switching unit 6 based on the conditions beforehand defined according to the detection value of the speed detection decision control circuit 3, the conditions set up by Out switch 12, and the signal from the go-astern detector

10 is added. Since other configurations are the same as the gestalt 1 of operation, the explanation which gave the same sign to the same component and overlapped is omitted.

[0025] If a go-astern detecting signal is received from the go-astern detector 10, while the decision control circuit 11 directs to control the 1st video switching unit 5 through a control circuit 7, and to choose the image from CCD camera 13 for a back monitor, it controls the 2nd video switching unit 6, and is made to change and display it on an image from CCD camera 13 for a back monitor. If the input of a go-astern detecting signal is lost, it will return to the supervision mode of the front side of a basis. Thus, since according to the gestalt 6 of this operation it changes to the image of car back when a car goes astern, the safety check of car back can be performed.

[0026] (Gestalt 7 of operation) Drawing 9 shows the configuration of the car side supervisory equipment in the gestalt 7 of the operation corresponding to claim 7 of this invention. In the configuration of the gestalt 1 of the above-mentioned implementation, while the gestalt 7 of this operation forms CCD camera 13 for a back monitor in the car back. The go-astern detector 10 which detects a go-astern gear input and is inputted into the speed detection decision control circuit 3, The decision control circuit 11 which performs change control to the 2nd video switching unit 6 based on the conditions beforehand defined according to the detection value of the speed detection decision control circuit 3, the conditions set up by Out switch 12, and the signal from the go-astern detector 10 is added. Since other configurations are the same as the gestalt 1 of operation, the explanation which gave the same sign to the same component and overlapped is omitted.

[0027] If a go-astern detecting signal is received from the go-astern detector 10, while the decision control circuit 11 directs to control the 1st video switching unit 5 through a control circuit 7, and to choose the image from CCD camera 13 for a back monitor, it controls the 2nd video switching unit 6, and is made to change and display it on an image from CCD camera 13 for a back monitor. If the input of a go-astern detecting signal is lost, it will return to the supervision mode of the front side of a basis. Thus, since according to the gestalt 6 of this operation it changes to the image of car back when a car goes astern in addition to the effectiveness of the gestalt 1 of operation, the safety check of car back can be performed.

[0028] (Gestalt 8 of operation) Drawing 10 shows the configuration of the car side supervisory equipment in the gestalt 8 of the operation corresponding to claim 8 of this invention. The gestalt 8 of this operation adds the synchronizing signal separation circuit 14 which separates a synchronizing signal into the configuration of the gestalt 7 of the above-mentioned implementation from the video signal of CCD cameras 1, 2, or 13. Since other configurations are the same as the gestalt 7 of operation, the explanation which gave the same sign to the same component and overlapped is omitted.

[0029] The synchronizing signal separation circuit 14 separates a ~~frame alignment~~ signal from the video signal of CCD cameras 1, 2, or 13. While outputting a frame reset pulse signal to the camera of the direction which has not indicated by current based on the signal from the synchronizing signal separation circuit 14 which separated the Vertical Synchronizing signal from the camera which is indicating by current from the video signal in the control circuit 7 suitably, change actuation of the 1st video switching unit 5 is controlled by judging the existence of an image with the signal from the synchronizing signal separation circuit 14, and inputting the output into a control circuit 7. thereby -- right and left -- a side monitor can be chosen the CCD camera of the direction which can output an image when one of CCD cameras broke down, or when the image of one of the two's CCD camera cannot be outputted by a collision etc. and performed continuously, and even when there is no camera video signal to which frame reset is applied fixed time amount, the image of a camera normal at least can be displayed.

[0030] (Gestalt 9 of operation) The gestalt 9 of the operation corresponding to claim 9 of this invention explains the configuration which added the alphabetic character superposition circuit 9 to the configuration of the gestalt 8 of operation, as the alphabetic character superposition circuit 9 explained with the gestalt 3 of operation is added to the car side supervisory equipment explained to the gestalten 5-8 of the above-mentioned implementation at least and is shown in it here at drawing 11. The alphabetic character superposition circuit 9 outputs the alphabetic signal according to directions of operation or notation signal of a control circuit 7 to a signal in piles from CCD cameras 1, 2, or 13 at a video signal. The purport which is a right-hand side camera when a control circuit 7 controls the 1st video switching unit 5 and chooses right-hand side CCD camera 1 by this is displayed. The purport which is a left-hand side camera when left-hand side CCD camera 2 is chosen is displayed. When the conditions which display a camera on either side by turns are chosen, a display to that effect can be performed, when the back camera 13 is chosen, the purport which is a back camera can be displayed, and it can know easily the image from which camera is displayed now.

[0031] (Gestalt 10 of operation) Drawing 12 shows the configuration of the car side supervisory equipment in the gestalt 10 of the operation corresponding to claim 10 of this invention. The gestalt 10 of this operation is equipped with the image composition circuit 15 which compounds the image from CCD cameras 1, 2, and 13 on one image instead of the 1st image switcher 5 in the gestalt 7 of the above-mentioned implementation, and since other configurations are the same as the gestalt 7 of operation, it omits the explanation which gave the same sign to the same component and overlapped.

[0032] The image composition circuit 15 consists of the memory control circuit 16, A/D converter 17 for back cameras A/D converter 18 for left cameras, A/D converter 19 for right cameras, image memory 21 that memorizes the 20 or 1 D/A converter image which outputs a video signal, and a synchronizing signal generating circuit 22 which generates a change synchronizing signal, as shown in drawing 13. The video signal from each CCD cameras 1, 2, and 13 is changed into a digital signal by A/D converters 17, 18, and 19, respectively, and is accumulated in the image memory 21 through the memory control circuit 16. A synchronization is taken between each camera by the synchronizing signal from the synchronizing signal generating circuit 22 in that case. Based on control of the memory control circuit 16, reading appearance of the data stored in the image memory 21 is compounded and carried out, they are changed into an analog signal by D/A converter 20, and are outputted to the video switching unit 6 of drawing 12.

[0033] Thus, while being able to compound and display [according to the gestalt 10 of this operation] the image of the car front side and back on a small screen suitably in addition to the effectiveness of claim 7, a whole screen can also be displayed, and it can display automatically, maintaining at the magnitude which is easy to recognize the screen product of a required image. In addition, also in the gestalt of this operation, an image detector 8 like a gestalt 4 and the alphabetic character superposition circuit 9 of operation can be added.

[0034] In addition, in the gestalten 6-10 of the above-mentioned implementation, although it constitutes so that the power source of CCD camera 13 for a back monitor may be controlled by the current supply circuit 4, it is also possible to change into a condition [having switched on the power source]. Moreover, the go-around detector 10 may be acquired by the signal input from the go-around status-display equipment of a back-up lamp or an instruments panel, or the communication link which leads Car LAN.

[0035] Moreover, although the image detector 8 in the gestalten 2 and 4 of operation is formed in the latter part of the 1st video switching unit 5, it may be formed immediately after CCD cameras 1 and 2. In this case, before changing the fault and image whose amount of circuits increases, the advantage which can detect the existence of a signal is, but since the object of the changed camera is clear, since it is unnecessary, by employment, a magnitude difference does not usually become.

[0036] Moreover, although constituted from the above explanation in the circuit of the speed detection decision control circuit 3, a control circuit 7, the image detector 8, the go-around detector 10, and decision control circuit 11 grade, each circuit may be programmed and you may realize on a signal processor, for example, the microcomputer which contained the program. Furthermore, one of the images of the left, the right, or back is not changed thoroughly, but the small screen and whole screen which were shown in the gestalt 10 of operation are compounded using this change signal, you may make it replace a large and small screen, and this can be easily carried out by making it synchronize using frame reset and inputting an image using the technique of memory recording and a display. Furthermore, the turn signal at the time of right-turn and left turn is interlocked with, you may make it change a right-and-left image, and this can be easily carried out only by adding the signal from a blinker to ejection and processing conditions, for example, the direction which attaches and turns at a difference to switching time on either side can also be displayed preferentially. Furthermore, if map information, such as navigation, and crossing information may be inputted and change conditions are changed instead of the signal of Out switch 12, a route situation and the display condition from other control units can also be added compulsorily.

[0037]

[Effect of the Invention] In order that a control circuit may choose the image from two sets of image pick-up means according to invention of this invention according to claim 1, By starting or ending a display by being able to display a camera image, without reducing a screen size to a display, and detecting a car rate, and considering and controlling the conditions of time amount and an Out switch The image of the right and left according to an operating condition can be independently displayed on the same display, and while a change is automatable in the range used as the hindrance of operation, it can be made compatible also with visibility. Moreover, it can consider as assistance of the safety check of the car front side, without displaying an image with a car rate, and supposing that it is non-display by lifting of a car

rate, and lifting a hand from steering of a car and gear change actuation. Furthermore, since it was made not to output a camera image during the transit more than the constant speed defined beforehand, the insurance of operation is securable. Furthermore, power consumption, such as a battery of a car, can be held down to the need minimum by detecting a car rate and performing control which turns on a camera beforehand. Moreover, according to the conditions of an Out switch, in delay etc., the automatic display function of an image can turn OFF compulsorily, when clearly unnecessary.

[0038] According to invention of this invention according to claim 2, by supervising the signal from two sets of image pick-up means, and detecting the existence of a signal to above-mentioned claim 1, an image input can twist, the camera of the direction cannot be chosen and a monitor can be continued using the camera image of the direction which can be supervised.

[0039] an image condition, and viewing and the camera image which the condition that the visual field narrowed [the selected image] according to causes, such as a failure, according to invention of this invention according to claim 3, and right and left resembled -- comparing -- right and left -- which camera image is easily discriminable also in which image or the condition that decision is difficult with character representation or a notation display.

[0040] While according to invention of this invention according to claim 4 having the effectiveness of claims 2 and 3 and being able to continue a monitor with the camera which can be supervised at least, it is easily discriminable which is the image of the camera in which an image monitor is possible, or which is a camera image on display with the alphabetic character or notation displayed on a screen.

[0041] Since according to invention of this invention according to claim 5 the external image is indicated by precedence when it is detected that displayed the image of the method of car front both sides during a car halt or low-speed transit, and the go-astern gear entered, when the function which displays a back monitor image is attached to the existing system, an external image can be changed only by a car operator operate a go-astern gear.

[0042] Since according to invention of this invention according to claim 6 the image of car back is indicated by precedence when it is detected that displayed the image of the car front 1 side during a car halt or low-speed transit, and the go-astern gear entered When a car operator operates a go-astern gear, the image of order can be automatically chosen like the migration direction of a car and the car has stopped, an image can be automatically changed by actuation of only a gear.

[0043] Since according to invention of this invention according to claim 7 the image of car back is indicated by precedence when it is detected that displayed the image of the method of right-and-left both sides ahead of a car during a car halt or low-speed transit, and the go-astern gear entered When a car operator operates a go-astern gear, the image of order can be automatically chosen like the migration direction of a car and the car has stopped, an image can be automatically changed by actuation of only a gear.

[0044] arranging the timing changed within a synchronous fly-back-line period, while carrying out an image output to the same timing, without adding a signal separation circuit, a PLL circuit, etc. for external synchronization circuits to a camera miniaturizing as much as possible according to invention of this invention according to claim 8 -- right and left -- without a screen being in disorder even if one of camera images are not outputted, it can change to the camera image which can be supervised and a monitor can be continued.

[0045] an image condition, and viewing and the camera image which the condition that the visual field narrowed [the selected image] according to causes, such as a failure, like claim 3 as for invention of this invention according to claim 9, and right and left resembled -- comparing -- right and left -- a camera image is easily discriminable also in which image or the condition that decision is difficult with character representation or a notation display.

[0046] Invention of this invention according to claim 10 can choose the camera image of the front side and back extensively by replacing them and controlling it by image composition, while displaying the image picturized with two or more image pick-up means in one of a small screen and the whole screens. Moreover, a display can be automatically changed by making the multiple selection of the small screen, maintaining at the magnitude which can display many information on other cars, an obstruction, etc., and is easy to recognize the screen product of a required image.

[Translation done.]

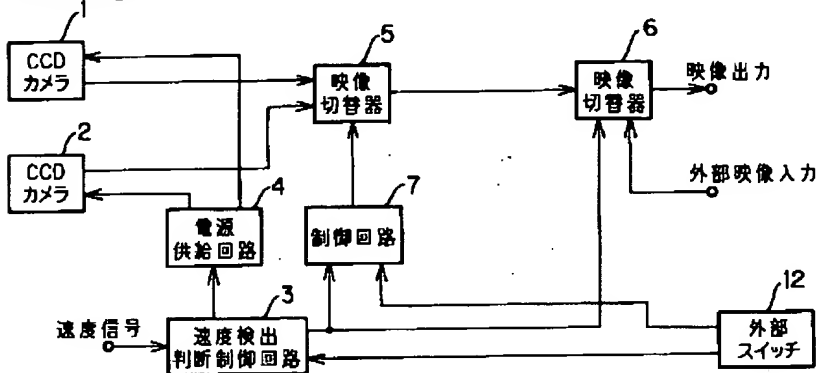
* NOTICES *

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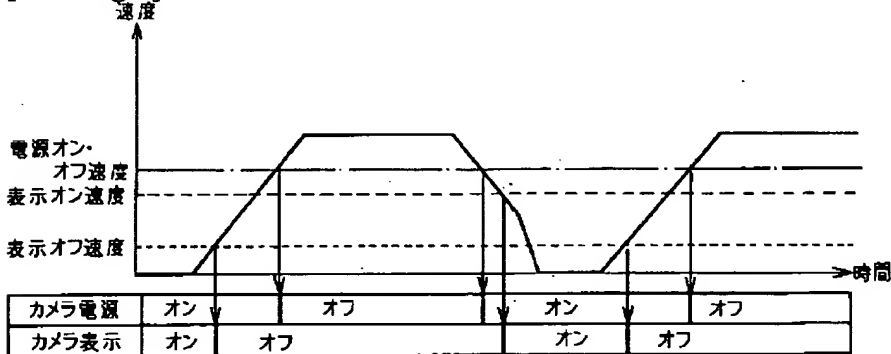
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]



[Drawing 3]



[Drawing 2]

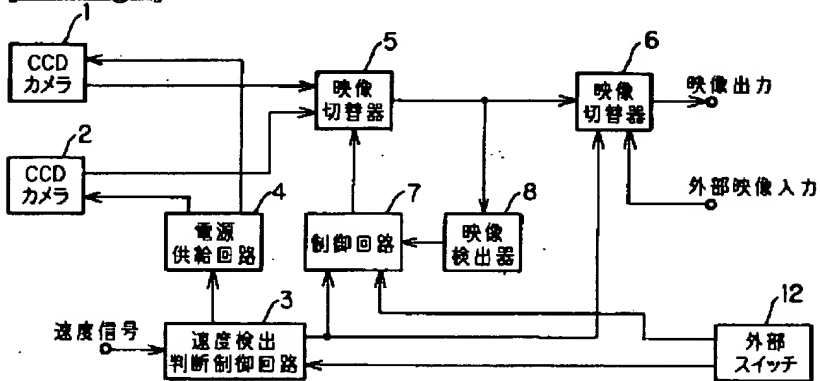
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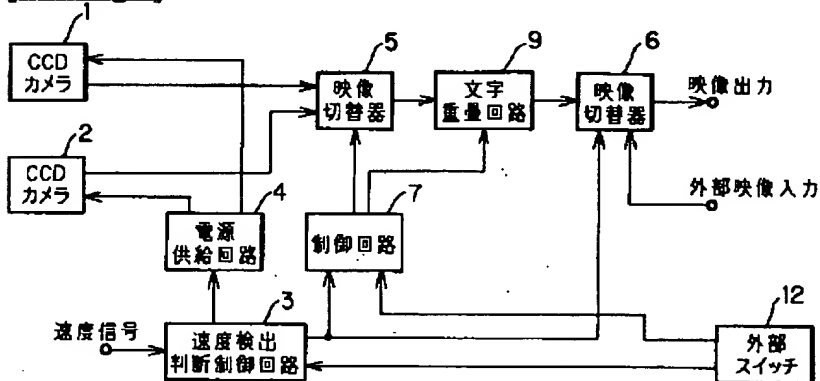
(b)

実現する機能の条件	スイッチの状態			
	左カメラ	左右	右カメラ	全機能
左カメラを選択する条件	オン	オフ	オフ	オン
右カメラを選択する条件	オフ	オフ	オン	オン
左右交互選択する条件	オフ	オン	オフ	オン
表示を強制オフする条件	任意	任意	任意	オフ

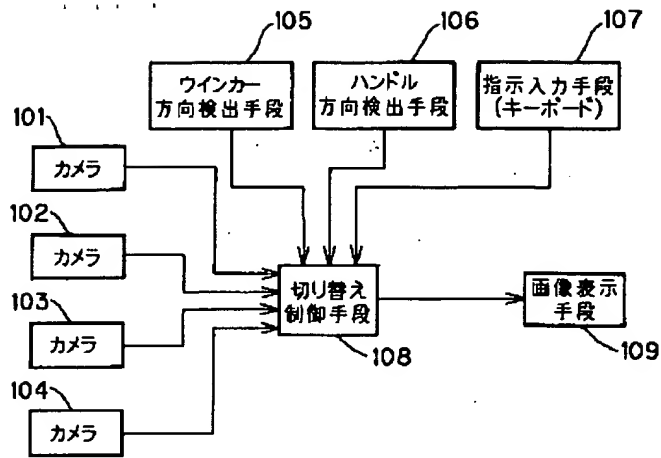
[Drawing 4]



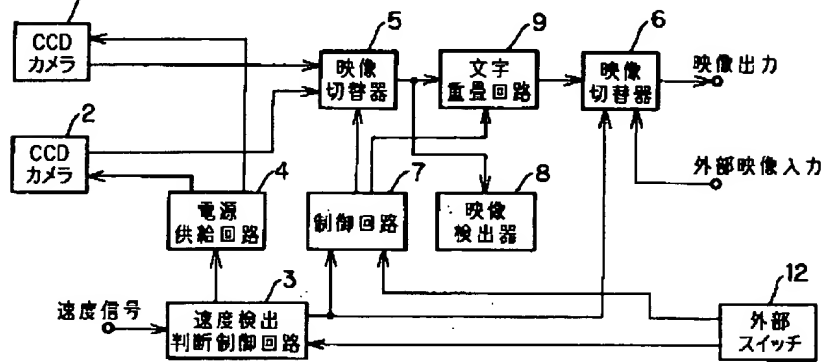
[Drawing 5]



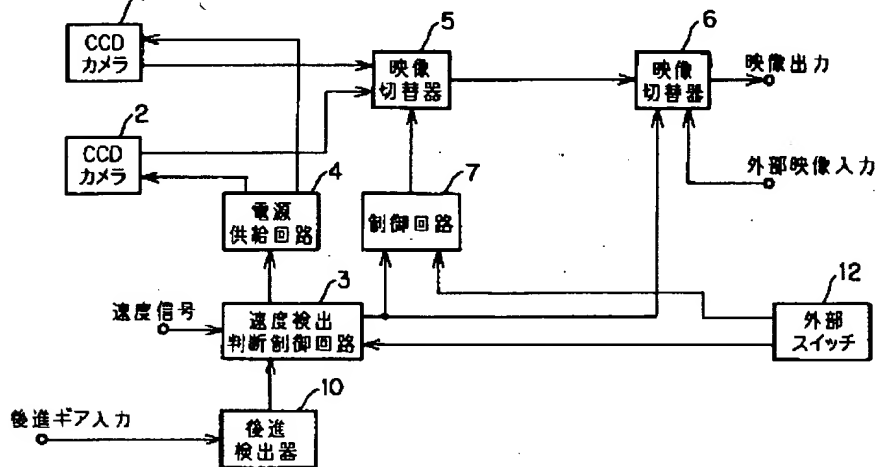
[Drawing 14]



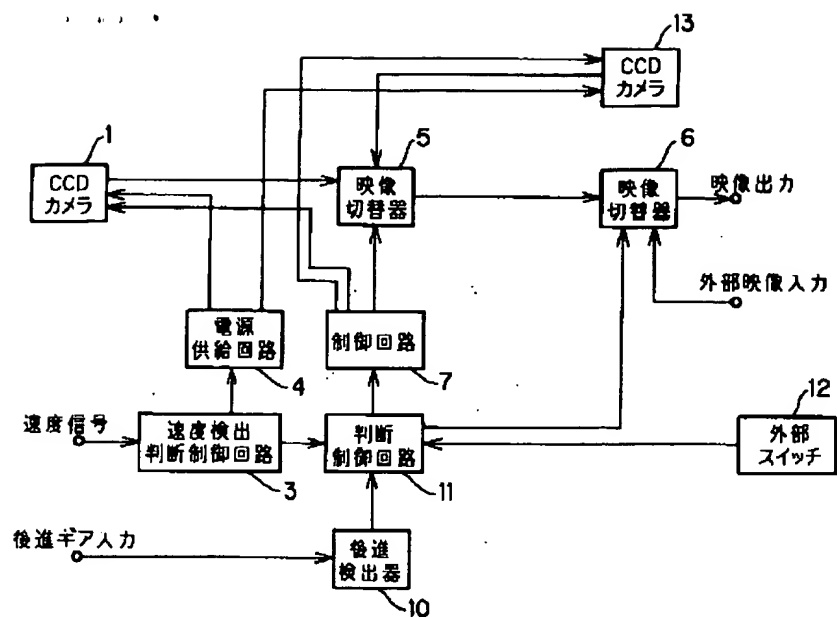
[Drawing 6]



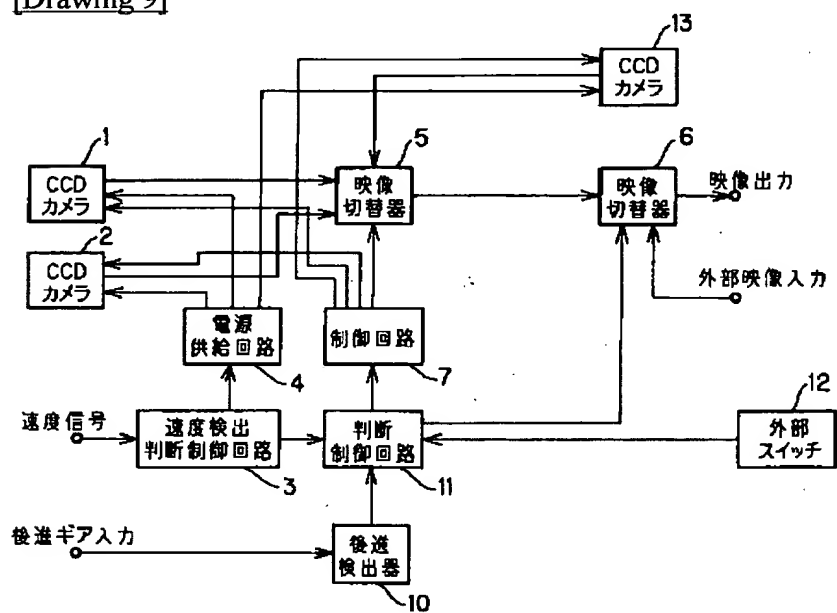
[Drawing 7]



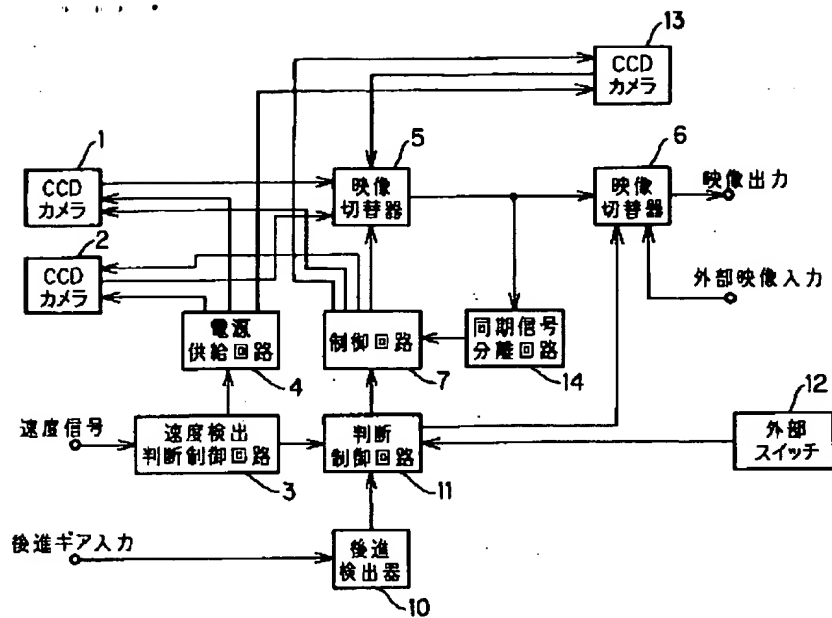
[Drawing 8]



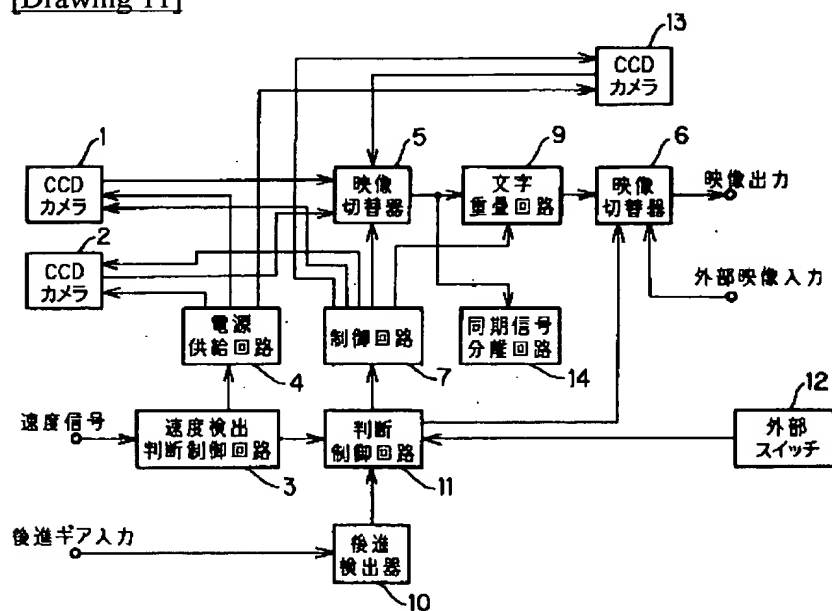
[Drawing 9]



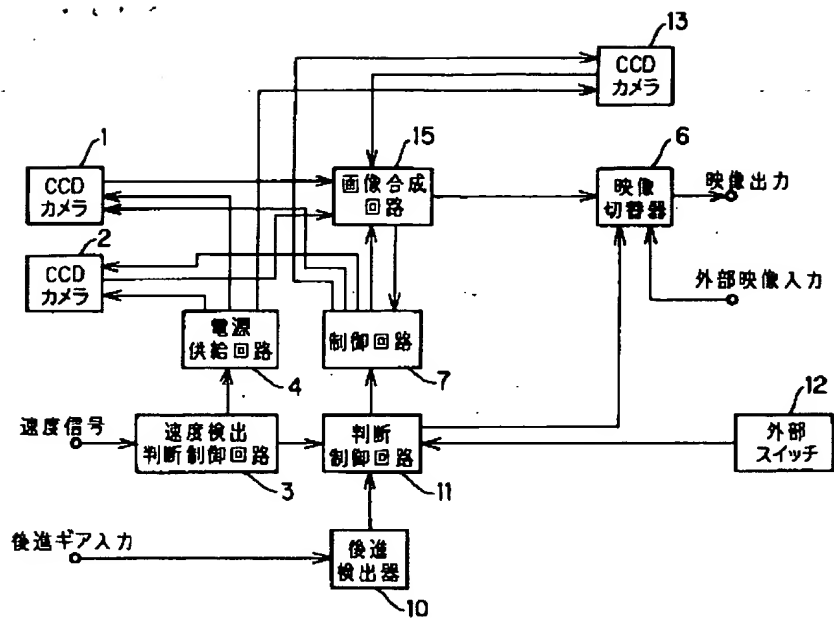
[Drawing 10]



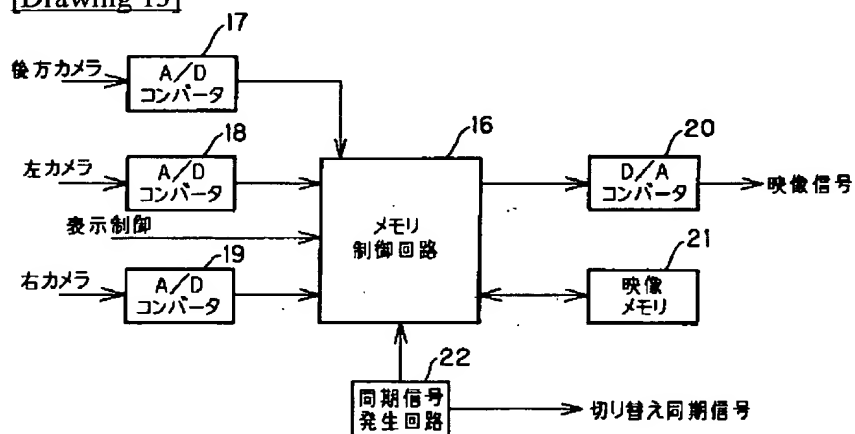
[Drawing 11]



[Drawing 12]



[Drawing 13]



[Translation done.]